

Harnessing Nigeria's Forestry Potential for Structural Applications: Structural Reliability of Nigerian Grown Opepe Timber

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Abstract : This study examined the structural reliability of the Nigerian grown Opepe timber as bridge beam material. The strength of a particular specie of timber depends so much on some factors such as soil and environment in which it is grown. The steps involved are collection of the Opepe timber samples, seasoning/preparation of the test specimens, determination of the strength properties/statistical analysis, development of a computer programme in FORTRAN language and finally structural reliability analysis using FORM 5 software. The result revealed that the Nigerian grown Opepe is a reliable and durable structural bridge beam material for span of 5000mm, depth of 400mm, breadth of 250mm and end bearing length of 150mm. The probabilities of failure in bending parallel to the grain, compression perpendicular to the grain, shear parallel to the grain and deflection are 1.61×10^{-7} , 1.43×10^{-8} , 1.93×10^{-4} and 1.51×10^{-15} respectively. The paper recommends establishment of Opepe plantation in various Local Government Areas in Nigeria for structural applications such as in bridges, railway sleepers, generation of income to the nation as well as creating employment for the numerous unemployed youths.

Keywords : bending and deflection, bridge beam, compression, Nigerian Opepe, shear, structural reliability

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